PSYCHE

A JOURNAL OF ENTOMOLOGY

ESTABLISHED IN 1874

VOL. XLII JUNE, 1935 No. 2

CAMBRIDGE ENTOMOLOGICAL CLUB 1874

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PSYCHE is published quarterly, the issues appearing in March, June, September, and December. Subscription price, per year, payable in advance: $2.00 to Subscribers in the United States; foreign postage, 25 cents extra, Canada 15 cents. Single copies, 65 cents.

Cheques and remittances should be addressed to Treasurer, Cambridge Entomological Club, Institute of Biology, Harvard University, Cambridge, Mass.

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Reprints of articles may be secured by authors, if they are ordered before, or at the time proofs are received for corrections. The cost of these will be furnished by the Editor on application.

Entered as second-class mail matter at the Post Office at Boston, Mass. Acceptance for mailing at special rate of postage provided in Section 1103, Act of October 3, 1917, authorized on June 29, 1918.

Printed by the Eliot Press Inc., Jamaica Plain, Mass., U. S. A.

PSYCHE

VOL. XLII JUNE 1935 No. 2

A FEW SOUTHERN SPIDERS

BY ELIZABETH B. BRYANT

Museum of Comparative Zoölogy, Harvard University

During recent years, several small collections of spiders from Florida have been received at the Museum of Comparative Zoölogy and among them are a few new and little known species. All types are in the museum collection.

GNAPHOSIDÆ

Herpyllus emertoni sp. n. (Pl. V, Figs. 1, 2.)

♀ 6 mm. long, ceph. 2.5 mm., abd. 4 mm.

Cephalothorax golden brown, with short, colorless hairs on the sides, thoracic groove long and distinct; eyes covering two thirds the width of the head, anterior row slightly recurved, a.m.e. largest of the eight, separated by a radius and almost touching the a.l.e., posterior row same length as anterior, slightly procurved, subequal, p.m.e. round, separated by a diameter and from p.l.e. by fully a radius, lateral eyes separated by radius of p.l.e.; quadrangle of median eyes higher than wide and a little wider in front than behind; clypeus less than a diameter of a.m.e.; mandibles brown, slightly attenuate, superior margin of fang groove with three teeth, median largest, inferior margin with one small tooth, labium higher than wide; maxillæ not twice as high as labium, slightly inclined over labium, margin straight with darkened edge; sternum oval, widest between II coxæ, pointed between IV coxæ; abdomen pale yellow, with scattered dark hairs; legs same color as cephalothorax with many long hairs, spines, I tibia beneath, 1 at tip, 1 median, metatarsus 1-1, basal, III tibia with a medium dorsal spine; epigynum dark, with two large oblique, oval areas below the skin above a transverse depressed oval which has paired circular openings near the upper margin.

♂ 5.7 mm. long, ceph. 2.6 mm., abd. 2.8 mm.

Coloring and eyes same as in female; palpus seen from above, patella and tibia of about equal length, from below, tibia wider than long, tibial apophysis bent almost at right angle ending in a slender, sharp hook, palpal organ completely filling cavity, embolus straight and dark, origin near the base half hidden by a semi-transparent lobe which protrudes from the plane of the palpus, tip of embolous reaches nearly the end of cymbium.

Holotype ♀ Florida; Dunedin (W. S. Blatchley).

Allotype ♂ Florida; Dunedin (W. S. Blatchley).

Herpyllus floridanus (Banks) (Pl. V, Fig. 3.)

Prosthesima floridana Banks, Trans. Amer, Ent. Soc., 1896, 23, p. 61.

♀ 7 mm. long, ceph. 2.8 mm., abd. 4.3 mm.

Cephalothorax yellowish brown with scattered long black hairs, narrowed in front, thoracic groove short but distinct; eyes covering middle half of head, anterior row straight, a.m.e. largest of the eight, separated by their radius and almost touching a.l.e., posterior row slightly procurved, seen from above, a little longer than anterior row, p.m.e. oval, separated by their long diameter and by almost the same distance from p.l.e., lateral eyes separated by almost a diameter; quadrangle slightly wider in front and higher than wide; clypeus less than radius of a.m.e., margin with a row of long black hairs; mandibles brown with many long hairs, porrect and slightly attenuate, fang groove short, distinct carina on superior margin, no tooth or carina on inferior margin; labium once and a half times as high as wide, more than half as long as maxillæ; maxillæ two and a half times as long as wide, tips slightly widened, sternum light brown with scattered fine hairs, oval, at anterior end about twice the width of labium, pointed at posterior end, widest between II coxæ; abdomen yellowish gray, pale, covered with fine hairs; muscle spots distinct, venter pale, covered with fine hairs; legs, I right leg missing, anterior pairs darker than posterior, I leg short, metatarsus equals patella, I and

II metatarsi and tarsi scopulate, spines I and II tibiæ, beneath, 1 at tip, 1 median, metatarsi 1-1, basal, all spines short and inconspicuous, posterior tibiæ and metatarsi with many ventral spines, III tibia, 1 dorsal basal spine; epigynum a darkened oval area with a pair of oval depressions in posterior part separated by a darkened ridge, openings apparently a pair of circular pits separated by less than their diameter above the darkened ridge in the depression.

Holotype ♀ Florida, Punta Gorda (Mrs. A. T. Slosson).

Poecilochroa decipiens (Chamb.) (Pl. V, Figs. 4, 5.)

Sergiolus decipiens Chamberlin, Proc. Biol, Soc. Wash., 1922, 35, p. 151.

♀ 6,2 mm. long, ceph. 3.2 mm., abd. 3.2 mm.

Cephalothorax golden brown with scattered black hairs most numerous about eyes and posterior margin, thoracic groove short; eyes cover middle half of head, anterior row straight, a.m.e. largest of the eight, separated by less than a radius, and nearer to a.l.e., posterior row a little longer than anterior, slightly recurved, equidistant and subequal, p.m.e. round, lateral eyes separated by more than a diameter of p.l.e.; quadrangle of median eyes higher than wide and the same width behind as in front; clypeus higher than diameter of a.m.e. with a row of long black bristles near margin; mandibles a golden brown with many long black bristles, superior margin of fang groove with a broad tooth or carina, no tooth on inferior margin; labium very high and narrow, two thirds the length of the maxillæ; maxillæ slightly widened at tips, and not inclined over labium; sternum twice as long as wide, at anterior end little wider than labium, pointed between IV coxæ; abdomen brownish-gray, thickly covered with long hairs, two light bands, one basal and one about the middle, neither continued on venter, sides and venter brownish, thickly covered with hairs; legs same color as cephalothorax covered with short hairs, spines, I and II tibiæ, beneath, 1-1, at tip, 1 median, metatarsi, 1 basal, III tibia, 1 dorsal median spine; epigynum a pair of brown oval areas beneath the skin above a transverse oval depression with a pair of circular openings by the lower margin which are separated by at least three diameters.

Allotype ♀ Florida; Royal Palm Park, 1-18 April 1927 (W. S. Blatchley).

Both male and female were found at Royal Palm Park, Florida. The male is marked much like *Sergiolus variegatus* (Hentz) but it is smaller and the posterior eye row is less recurved so that the lateral eyes are closer together. The tibial apophysis of the palpus is pressed close to the tarsus until near the distal end when it bends outward as figured. In all males seen the thoracic groove is distinct. The epigynum is equally distinct from *Sergiolus variegatus* (Hentz).

Sergiolus tribolus Chamberlin (Pl. V, Fig. 6.)

Proc. Biol. Soc. Wash., 1922, 35, p. 153.

♀ 7 mm. long, ceph. 2.8 mm., abd. 4.5 mm.

Cephalothorax shining yellowish-brown with a few long black hairs, most numerous about the eyes, nearly twice as long as wide, no thoracic groove; eye area covering the middle half of the head, anterior row of eyes slightly recurved, a.m.e. slightly largest of the eight and separated by less than a radius, and from a.l.e. by less than half a radius, posterior row of eyes longer than anterior, slightly recurved, subequal, p.m.e., round, separated by at least two diameters and from p.l.e. by more than one, p.l.e. directed slightly backward, lateral eyes separated by more than a diameter of p.l.e.; quadrangle of median eyes wider behind and higher than wide; clypeus higher than diameter of a.m.e. with a row of long black hairs midway between margin and anterior row of eyes; mandibles yellowish-brown, covered with long black hairs, attenuate, no teeth on either margin of fang groove, fang groove short; labium twice as high as wide and more than half as long as maxillæ; maxillæ more than twice as long as wide, tips widened; sternum twice as long as wide, at anterior end only a little wider than labium, widest between II coxæ, pointed between IV coxæ which are separated by half a diameter, abdomn glossy black, without hairs except for a fringe at base, two white bands of equal width, one at base which does not meet and one about middle; sides and venter hairless, basal half of venter pale yellow which continues as a median tongue or lobe towards the spinnerets, posterior half black; legs same color as cephalothorax and sternum, spines, femora with long dorsal spines, 1 tibia, beneath, 1 apical, metatarsus 1-1, basal, II tibia, 1 apical, 1 above the middle, metatarsus 1-1, basal, III tibia dorsal, 1 median spine near base, posterior legs spiny; epigynum dark brown, in lower part are two broad oval areas almost touching above a median transverse oval, very black between.

Allotype ♀ Florida, Sebastian, April 1934 (G. Nelson).

This species was made for one male from Punta Gorda, Florida, identified by Mr. Banks as *Sergiolus cyanoventris* Simon. This latter species was made from a female also from Florida. The original description is very brief and it is very probable that the two species are the same.

In 1891 Simon separated *Herpyllus variegatus* Hentz from the genus *Poecilochroa* because it lacked the thoracic groove and made for it the genus *Sergiolus*. Recently in examining all adult specimens of that species in the museum collection, the groove has been found, sometimes very short and faint, but always present. It is not easy to understand how such an error arose as Emerton figures the groove in his paper of 1890. In many of Chamberlin's species described as *Sergiolus* the groove is very distinct. Chamberlin states that it is "questionable whether this genus, *Sergiolus*, can be maintained apart from *Poecilchroa* with which it agrees closely in most structural features."

Drassyllus wallacei sp. n. (Pl. V, Figs. 7, 8.)

♀ 5.5 mm. long, ceph. 2.3 mm., abd. 3.2 mm.

Cephalothorax light brown with two parallel dark gray stripes extending from lateral eyes to posterior margin, heavily veined diagonally with black as striæ, narrow black marginal line and black about the eyes, thoracic groove long and distinct; eyes cover middle half of head, anterior row very slightly procurved, eyes subequal and equidistant, separated by a radius, posterior row slightly longer than anterior, procurved, eyes equidistant and subequal, separated by more than a diameter, p.m.e. round, not elliptical, lateral eyes separated by a diameter of p.l.e.; quadrangle of median eyes narrower in front and as high as width behind; clypeus not as wide as diameter of a.m.e.; mandibles, right mandible missing, light brown with two parallel black stripes, superior margin of fang groove with two small teeth, inferior margin with one tooth; labium grayish, as high as wide, with rounded sides; maxillæ shaded with gray, more than twice as long as labium, sides almost parallel; sternum light brown, shaded with gray about margins, almost as wide as long, broadly truncate below labium and pointed between IV coxæ, widest between II coxæ; abdomen dark gray, bright brown at base divided by a narrow gray stripe, the brown gradually changing to gray; sides gray; venter light brown, mottled with gray which forms three vague stripes; legs, femora heavily banded with dark gray, patellæ and tibiæ gray, dorsally with two parallel light stripes separated by a narrow gray line, metatarsi and tarsi brown, spines, I tibia, beneath, 2-2, basal and median, basal pair almost half the length of the joint, metatarsus, 2-2; lower spinnerets separated by half a diameter; epigynum rather large, openings in upper margin, oval separated by their long diameter followed by a lobed figure with the margins heavily darkened.

Holotype ♀ Florida, Alachua Co., Wauberg Lake Station, 13 March, 1933 (H. K. Wallace).

LYCOSIDÆ

Lycosa ornatipes sp. n. (Pl. V, Figs. 9, 10.)

♂ 9.2 mm., ceph. 6 mm., abd. 3.4 mm.

Cephalothorax with light median stripe, reddish between second and third eye rows, widening behind third eye row, then narrowing before thoracic groove with sides slightly converging, stripe does not reach posterior margin, eyes surrounded by black, very narrow marginal black line, sides chestnut brown covered with short, white hairs except for a small area back of third row of eyes where hairs are black; eyes, anterior row as long as second row, straight, a.m.e. separated by more than a diameter and a half, eyes of second row separated by a diameter; quadrangle of posterior eyes wider behind and as high as space between eyes of second row; clypeus as high as diameter of a.m.e.; mandibles yellow, covered with short, white and long, black hairs, inferior margin of fang groove with three stout teeth, superior margin with two teeth, fang evenly curved; labium, maxillæ, sternum and coxæ pale, abdomen with a median black stripe, one third the width of abdomen, not reaching base and ending in front of spinnerets in a point, on each side and at the base is a white stripe, not as wide as the black, covered with short, white hairs, on each side a narrow black stripe which does not reach the spinnerets; venter with a median black spot from lung slits and surrounding the spinnerets, sides white, covered with white hairs; legs long and slender, pale, spines black and a few short, black hairs, I tibia black except for a narrow light ring at base and covered with short, black hairs, distal half of metatarsus black covered with black hairs, scopula on tarsi and distal half of metatarsi; palpus about as long as cephalothorax, light with terminal joint darker and covered with short, white hairs, tibia much longer than patella and about as long as terminal joint, palpal organ as figured.

♀ 16 mm. long, ceph. 8 mm., abd. 8 mm.

Cephalothorax with median light stripe, reddish but same shape as in male, does not reach posterior margin, sides chestnut brown, veined with black, covered with short white hairs, no marginal light stripe and area of black hairs behind third eye row much reduced; eyes same as in male; mandibles reddish mahogany with a few short, white hairs and long, black bristles; labium, maxillæ, sternum and coxæ light; abdominal markings not as distinct as in male, but the median dark stripe does not reach base and the lateral light stripes are poorly defined; venter, the black spot not as large as in the male and forms a triangle from the lung slits and does not reach the spinnerets; legs light and marked as in the male; epigynum of the usual inverted T type, median septum long, slender and slightly arched near the base, terminal cross piece about two thirds as long as the septum and wider, with a dark spot above at each end.

Holotype ♂ Florida; Alachua Co., Gainesville, Science Hall, 31 October 1933 (A. F. Carr).

Allotype ♀ Florida; Alachua Co., Biven's Arm, 6 May 1933 (H. K. Wallace).

The markings of this species are very distinct and quite unlike any other species. The epigynum is not unlike *Lycosa fatifera* (Hentz) but that species has no thoracic or abdominal markings and the venter is light. The black first tarsus and metatarsus are very conspicuous.

Schizocosa duplex Chamberlin (Pl. V, Fig. 11.)

Bull. Mus. Comp. Zoöl., 1925, 67, p. 231.

♀ 6.5 mm.

Cephalothorax with a median stripe of yellow, narrower than the third eye row and extending between the eyes of that row, margins even and slightly converging, sides dark brown with many white hairs, a narrow light supramarginal stripe rather broken; eyes, anterior row shorter than second row, a.m.e. separated by nearly a diameter and from a.l.e. by a radius, eyes of second row separated by a diameter and a half; quadrangle of posterior eyes wider behind than high; mandibles dark with three teeth on inferior margin of fang groove; sternum dark with a light stripe in middle; coxæ light; abdomen with a converging median light stripe from base to spinnerets, usual basal spear mark within rather indistinct and posterior half of median stripe with indistinct cross bars, sides dark; venter light with a row of dark spots about sides meeting at the spinnerets; legs brown with very faint darker rings on femora, anterior patellæ and tibiæ darker; epigynum, the median septum very long and narrow, sides parallel, cross piece shorter than median septum and the upper section narrower than the lower, the division on each side about one third the length of the cross piece.

Allotype ♀ Florida; Sebastian, 1922 (G. Nelson).

The male was described from Fairfax, Virginia, in 1925. It differs from *Schizocosa ocreata* (Hentz) by the lack of a brush of black hairs on the first tibia and the shorter horn in the male palpus. The females differ from *S. ocreata* by the very long and narrow septum in the epigynum and the comparatively short division in the cross pieces. Specimens collected by Mr. H. K. Wallace from Alachua Co., Florida, have the median stripe on the abdomen very distinct and the basal spear mark and cross bars very faint, so that the abdominal stripe appears as a continuation of the median stripe on the cephalothorax. Hentz describes and figures

Lycosa venustula with similar marking and ventral markings on the abdomen of lateral converging lines of dark spots but until more specimens are collected from Alabama and South Carolina, the region from which Hentz had his material, it is thought best to leave this species as *Schiozocosa duplex.*

Pardosa ocala sp. n. (Pl. V, Fig. 12.)

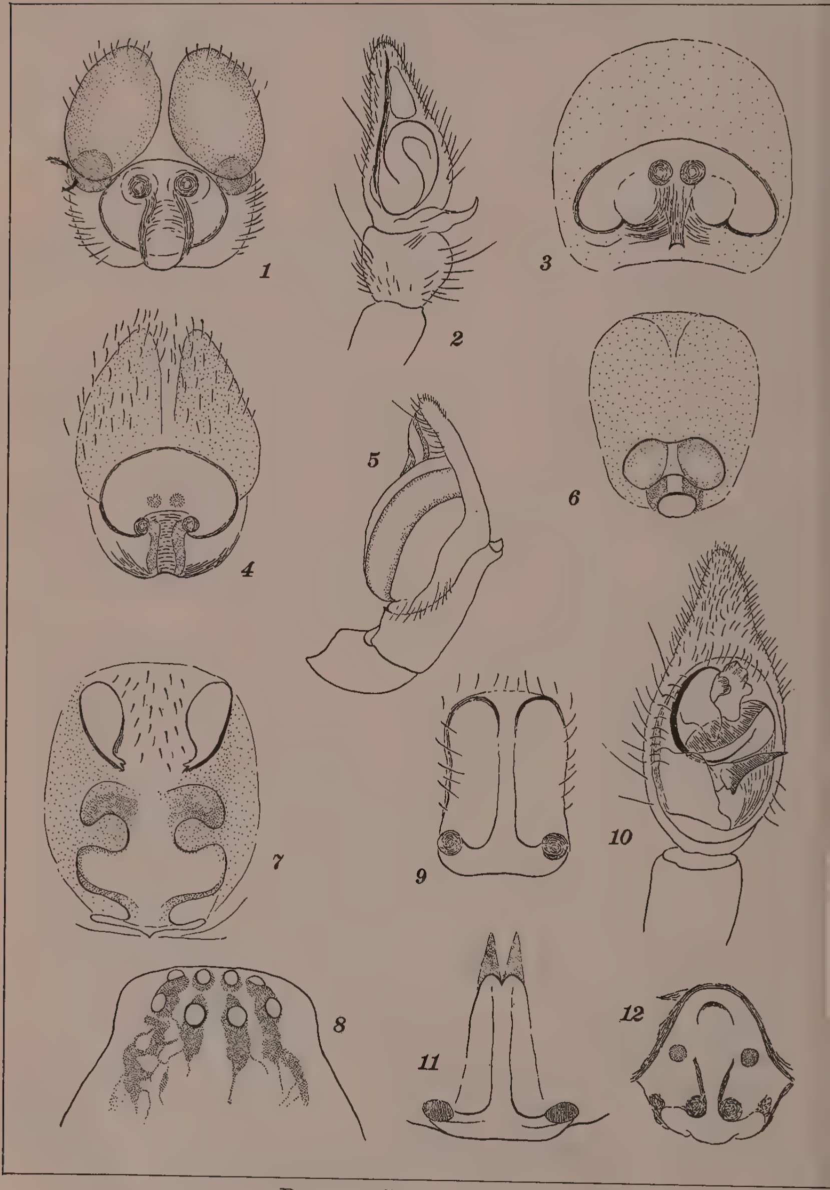
♀ 4.6 mm. long, ceph. 2.2 mm., abd. 2.6 mm.

Cephalothorax with a median light brown stripe extending between p.l.e. half way to the second eye row, widening to almost the width of p.l.e. and gradually narrowing to posterior margin, on each side a lateral dark stripe with numerous diagonal cross lines of black, submarginal light stripes almost as wide as dark stripe continue to clypeus, a narrow marginal dark line; eyes surrounded by black, anterior row shorter than second row, a.m.e. larger than a.l.e., separated by less than a diameter and from a.l.e. by a radius, eyes of second row separated by almost two diameters; quadrangle of posterior eyes wider behind and not as high as width in front; clypeus below a.m.e. twice diameter of a.m.e.; mandibles yellow with scattered long bristles, inferior margin of fang groove with three teeth; sternum yellow with three pairs of black spots about margin and an irregular black line from middle to posterior tip; abdomen with the usual basal spear mark very indistinct in a yellow stripe which extends from base to spinnerets, basal spear mark outlined by well separated black dots, followed by four pairs of small black dots on posterior half forming converging rows, each dot surrounded by bright yellow, each side of yellow stripe a gray stripe of the same width, sides and venter light; legs light with vague dark rings most distinct on femora, base of each dorsal spine surrounded by black, all spines unusually long, basal pair on first tibia more than half the length of the joint; epigynum with median septum narrow at its origin at the cross piece, widening but not reaching the anterior end.

Holotype ♀ Florida; Alachua Co., Hale's Siding, 14 October 1933 (H. K. Wallace).

Paratype ♀ Florida; Lake Co., 9 October 1933 (H. K. Wallace).

Psyche, 1935 VOL. 42, PLATE V.



Bryant—Southern spiders

The spines on the anterior tibiæ are much longer than is usually found even in this genus and the clypeus is higher, two characters noted by Tullgren in his description of *Pardosa longispina,* but the epigynum is very unlike the figure given for that species. The specimen from Lake Co. is darker but the markings are the same with submarginal light stripe continuing on the clypeus and the epigynum is the same with the median septum widening and not reaching the anterior end. Both specimens have egg sacs.

EXPLANATION OF PLATE V.

Fig. 1. *Herpyllus emertoni* sp. n.
Fig. 2. *Herpyllus emertoni* sp. n.
Fig. 3. *Herpyllus floridanus* (Banks).
Fig. 4. *Pœcilochroa decipiens* (Chamb.).
Fig. 5. *Pœcilochroa decipiens* (Chamb.).
Fig. 6. *Sergiolus tribolus* Chamb.
Fig. 7. *Drassyllus wallacei* sp. n.
Fig. 8. *Drassyllus ornatipes* sp. n.
Fig. 9. *Lycosa ornatipes* sp. n.
Fig. 10. *Lycosa ornatipes* sp. n.
Fig. 11. *Schizocosa duplex* Chamb.
Fig. 12. *Pardosa ocala* sp. n.

NOTES ON THE MYCETOPHILIDÆ WITH DESCRIPTIONS OF NEW SPECIES

By Frank R. Shaw

Cornell University, Ithaca, N. Y.

In working over material preparatory to writing the chapter on the Mycetophilidæ to be published in the Diptera of Connecticut, a few observations were made that are belived to be best published before that work appears.

Not a great deal of work has been done in this country on this group of insects since the appearance of the Genera Insectorum fascicle by Johannsen in 1909. Later, in a series of bulletins published by the Maine Agricultural Experiment Station, the same author gave keys to all of the known species occuring in this country.

Since that time Edwards of the British Museum has done the most outstanding work in the group. He revised the family in 1924 and as it is the belief of the writer that the paper of Edwards is not easily accessible to the average worker on Diptera, it is considered to be worthwhile to give a summary of Edwards' revision, giving the arrangement of the group according to Johannsen and comparing it with the classification of Edwards.

In Johannsen's revision of the group, nine subfamilies were recognized. According to Edwards' grouping there are ten subfamilies but they are not equivalent in all cases to those of Johannsen which bear the same name. Since it is the belief of the writer that there are many of the same or closely related species occuring both in Europe and in America, it is felt that a classification should be adopted which is uniform. Consequently, the revision of Edwards is being followed in this paper. The following table lists only those genera found in North America:

Subfamilies and Genera (Johannsen)	Subfamilies and Genera (Edwards)
Subfamily Bolitophilinæ	Subfamily Bolitophilinæ
Bolitophila	Bolitophila
Hesperinus	
Subfamily Pachyneurinæ	
Subfamily Mycetobinæ	Subfamily Ditomyiinæ
Mycetobia	
Palæoplatyura	
Ditomyia	Ditomyia
Symmerus	Symmerus
Subfamily Diadocidiinæ	Subfamily Diadocidiinæ
Diadocidia	Diadocidia
Subfamily Ceroplatinæ	Subfamily Ceroplatinæ
Asindulum	Asindulum
Ceroplatus	Ceroplatus
Cerotelion	
Hesperodes	Hesperodes
Apemon	Apemon
Platyura	Platyura
	Palæoplatyura
Subfamily Macrocerinæ	Subfamily Macrocerinæ
Macrocera	Macrocera
Subfamily Sciophilinæ	Subfamily Sciophilinæ
Monoclona	Monoclona
Eudicrana	Eudicrana
Tetragoneura	Tetragoneura (in part)
Sciophila	Sciophila (in part)
Paratinia	Paratinia
Polylepta	Polylepta (in part)
Empalia	Synapha
Dziedzickia	Dziedzickia (in part)
Neoempheria	Neoempheria
Mycomya	Mycomyia
	Allocotocera
Diomonus	Leptomorphus
	Neuratelia
	Syntemna
	Phthinia
	Megalopelma

Sciophila	Sciophila
	Acnemia
	Azana
	Speolepta
	Cœlosia
Hadroneura	Hadroneura
	Gnoriste
	Boletina
	Rondaniella
	Leia
	Pnyxia
	Docosia
	Megophthalmida
	Ectrepesthoneura
Subfamily Mycetophilinæ	Subfamily Mycetophilinæ
Gnoriste	
Probolæus	
Acnemia	
Azana	
Rondaniella	
Odontopoda	
Leptomorphus	
Allocotocera	
Boletina	
Leia	
Phthinia	
Cœlosia	
Syntemna	
Megophthalmidia	
Docosia	
Anatella	Anatella
Trichonta	Trichonta
Cordyla	Cordyla
Brachypeza	Brachypeza
Rhymosia	Rhymosia
Allodia	Allodia
Phronia	Phronia
Telmaphilus	
Exechia	Exechia
Dynatosoma	Dynatosoma
Opistholoba	
Epicypta	Epicypta
Mycothera	
Mycetophila	Mycetophila (in part)

Sceptonia	Sceptonia
Zygomyia	Zygomyia
Delopsis	Delopsis
Subfamily Sciarinæ	Subfamily Sciarinæ
Eugnoriste	
Manota	
Pnyxia	
Trichosia	Trichosia
Zygoneura	Zygoneura
Metangela	
Phorodonta	Phorodonta
Rhynchosciara	
Sciara	Sciara

The chief difference between the classification of Johannsen and that of Edwards will be noted in the limits of the two subfamilies Sciophilinæ and Mycetophilinæ. Johannsen, 1911, recognized that there were two quite distinct groups in the Mycetophilinæ and gave a classification of these two series based on the arrangement of setulæ on the wing. Edwards, 1924, become convinced that a more natural grouping would be obtained by placing the genera included in Series I of the Mycetophilinæ of Johannsen in the Sciophilinæ.

Since some of the genera have been split or united with other genera since the date of Johannsen's work, I believe it best to mention the more important changes that have occurred.

1. The genus Hesperinus was removed by Johannsen to the Bibionidæ.
2. Pachyneura is now placed in a separate family related to the Anisopodidæ.
3. Mycetobia is placed with the Anisopodidae by some authors or in a distinct family the Mycetobiidæ.
4. Palæoplatyura is placed with the Ceroplatinæ by Edwards.
5. Cerotelion is considered to be a subgenus of Ceroplatus.
6. Diomonus is united with the genus Leptomorphus.

7. Megalopelma includes one species of the genus Phthinia and probably will include some of the North American species of Sciophila.

8. Speolepta was erected for *Polylepta leptogaster* of Winnertz.

9. Ectrepesthoneura includes those species of Tetragoneura having the cubital fork near the base of the wing. According to Garrett, this genus is not valid but as the writer has not seen the evidence to support this view, he does not care to make any decision.

10. Probolæus is united with the genus Lygistorhina of the subfamily Lygistorhininæ.

11. Manota is placed in a distinct subfamily the Manotinæ.

12. Telmaphilus is united with the genus Phronia.

13. Opistholoba is united with the genus Mycetophila.

14. Mycothera is united with the genus Mycetophila.

15. Pnyxia is considered to belong with the Sciophilinæ according to Edwards.

In the course of the investigation a few specimens were encountered that are worthy of a more detailed discussion. Two of these were found to have been originally recorded from Greenland and from Europe. Specimens were sent to Edwards for an examination and he confirmed the identification. The writer wishes to acknowledge the assistance given to him by Doctor Edwards at this point.

Boletina groenlandica Staeg. Naturh. Tidsskr **1** : 356
(Pl. VI, Fig. 1.)

A specimen of this insect was taken by Dr. C. P. Alexander from Hermit Lake, Mt. Washington, New Hampshire. There is no figure of this species published in America so that a figure of the clasper (fig. 1) is given.

Allodia ornaticollis Meigan. Syst. Bescher **1** : 269.
(Pl. VI, Fig. 2.)

This is the first record of the capture of this European species in America. Since there is no figure published in this country of this species, the hypopygium (fig. 2) is pictured. Taken in Ithaca, N. Y. Nov. 1934.

Exechia aviculata sp. n. (Pl. VI, Fig. 3.)

Male. Length 4 mm. Head brown, palpi and antennæ light brown, basal two joints of antennæ yellowish. Thorax brown, humeri not tinged with yellow. Abdomen brown, the last three segments somewhat darker. Coxæ and femora with a brownish cast, tibia and tarsi yellow. Prothoracic basitarsus about one fourth longer than tibia, tibia swollen at the apex. Hypopygium (fig. 3) light brown resembling somewhat that of *Exechia januarii* Lunds. Type locality, Ithaca, New York. Type in my collection, paratype in Cornell University collection.

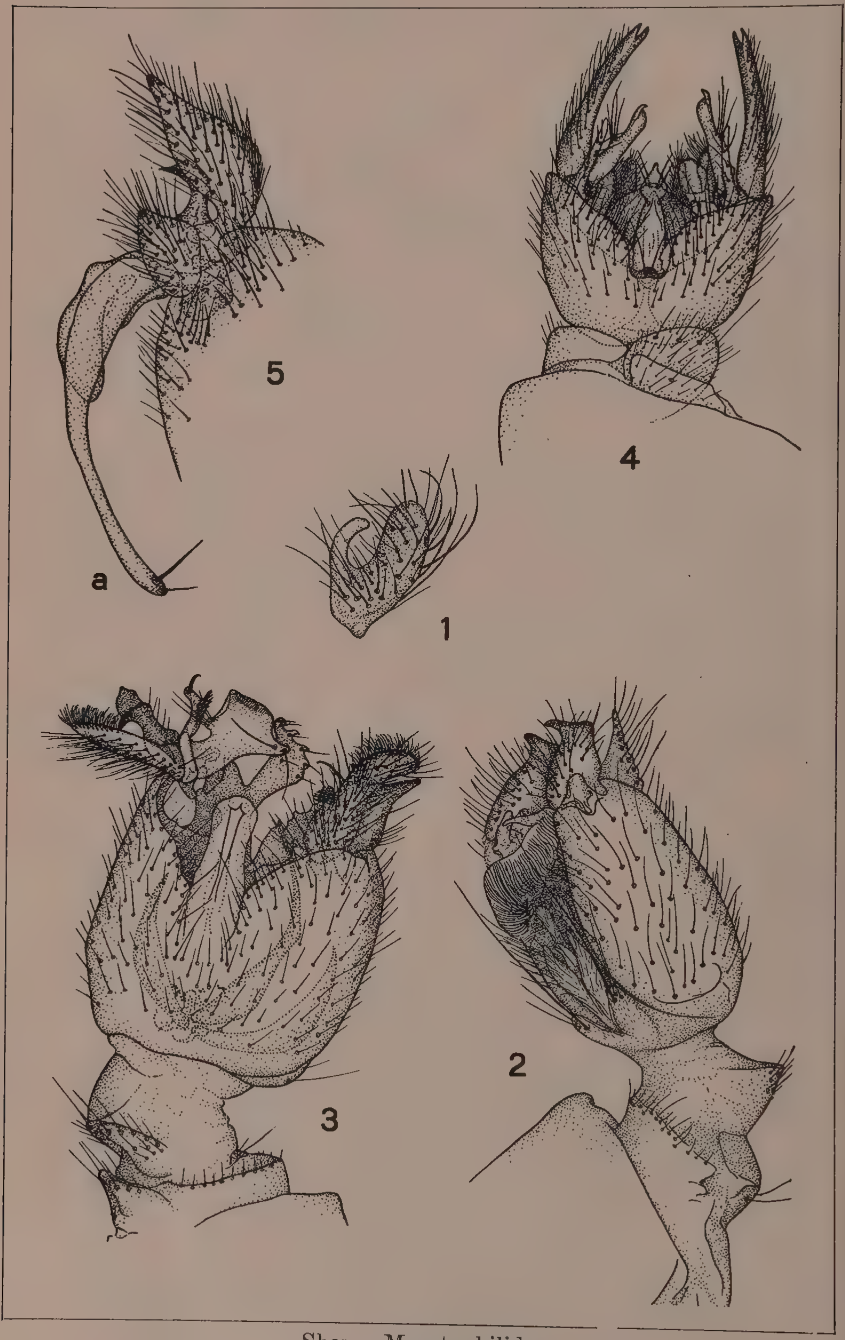
Exechia pollex sp. n. (Pl. VI, Fig. 4.)

Male. Length 3.5 mm. Head dark brown, palpi and antennæ brown, basal two segments of the antennæ light. Thorax dark brown, humeri with a light yellowish tinge. Abdomen concolorous, dark brown. Coxæ and femora yellow, tibia and tarsi somewhat darker. Prothoracic basitarsus and tibia subequal in length. Hypopygium (fig. 4) resembles that of *Exechia frigida* but differs in the details of the claspers. Type locality, Ithaca, New York. Type in my collection.

Rhymosia triangularis sp. n. (Pl. VI. Fig. 5.)

Male and female. Length 4-4½ mm . Head pale brown, palpi and basal two joints of antennæ yellow, remainder of antennæ brown. Mesonotum brown, lateral margins somewhat lighter. Coxæ and femora yellow, femora slightly darkened at apices. Tibia and tarsi brownish yellow. Prothoracic basitarsus about a third longer than the tibia. Dorsum of first and sixth abdominal segments brown. The remaining segments with subtriangular brown spots with the apex of each segment as the base of the triangle. Hypopygium (fig. 5) yellow, resembling that of *Rhymosa inflata* but one of the arms of the forceps is much more slender. Type locality, South Bethlehem, New York. Type in my collection, paratype in Cornell University collection.

Psyche, 1935 VOL. 42, PLATE VI.



Shaw—Mycetophilidae

Explanation of Plate VI.

Figure 1. Clasper of *Boletina grœnlandica.*
Figure 2. Hypopygium of *Allodia ornaticollis.*
Figure 3. Hypopygium of *Exechia aviculata.*
Figure 4. Hypopygium of *Exechia pollex.*
Figure 5. Lateral view of clasper of *Rhymosia triangularis.* A, arm of clasper.

Drawings made by D. B. Creager.

A NEW NAME FOR LITHOMYRMEX CARP. (HYMENOPTERA)

In my revision of the fossil ants (Bull. Mus. Comp. Zoöl., 70 (1) : p. 36), which was published in January, 1930, I established the myrmicine genus Lithomyrmex for two species, *rugosus* and *striatus,* from the Miocene shales of Florissant, Colorado. Unfortunately, the same generic name was used by Dr. J. Clark a few months earlier for a recent species of ant, *glauerti,* from West Australia (Journ. Roy. Soc. W. Australia, **14**: p. 36, 1929). I therefore propose the new name **Eulithomyrmex** for *Lithomyrmex* Carp. (*nec Lithomyrmex* Clark, 1929), to include the two extinct species from the Florissant shales—F. M. Carpenter.

THE LARVA OF ALLOMERUS (HYM.: FORMICIDÆ)

BY GEORGE C. WHEELER
University of North Dakota

That the genus *Allomerus* has received scant attention from myrmecologists might be attributed to its restricted range, the paucity of its species, the small size of the workers and the arboreal nesting habits. Nevertheless, my studies on the larvæ would seem to indicate that these ants merit more extensive investigation.

There are only two species in the genus—*decemarticulatus* Mayr and *octoarticulatus* Mayr. The latter has four varieties. In the *Genera Insectorum* (1922) Emery records the geographic distribution of all forms as "Brésil: Amazonas." *A. o.* var. *demeraræ* W. M. Wheeler (1929), however, occurs in British Guiana. The minute yellow workers and their much larger sexual forms inhabit natural cavities in swellings of plants in tropical rain forests. The most complete account of the habits of *Allomerus* is given by Dr. W. M. Wheeler in the *Transactions of the Fourth International Congress of Entomology* (1929, p. 343).

The larvæ of *Allomerus* unique in two characteristics —body hairs and sexual differentiation. The flattened, angulate body hairs of the worker and young sexual larvæ and the enormous, rigid, serrate ventral hairs of the mature sexual forms are peculiar to this genus. As a rule, the larvæ of the sexual forms of ants are differentiated from those of their workers chiefly by size. In *Allomerus*, however, they differ in size, shape and hairs, and these differences are so great that the two types might be regarded as generically distinct, were it not for the similarity of the heads.

Allomerus octoarticulatus Mayr. var. **demeraræ** W. M. Wheeler.

YOUNG WORKER LARVA (Pl. VII, Fig. 2): Similar to mature worker larva but more slender.

MATURE WORKER LARVA (Pl. VII, Fig. 1): Orthocephalic; prothorax forming a short, thick neck perpendicular to the rest of the body, which is subcylindrical; nearly straight, rather stout, and slightly attenuated posteriorly; posterior end round-pointed; anus subterminal. Metamerism indistinct. Spiracles, 10 pairs.

Body-hairs few, uniformly distributed, and arranged (at least on the abdomen) in transverse metameric rows and also (less regularly) in longitudinal rows. They fall into four types: (1) at the posterior end a very few small (about 0.016 mm. long) slender hairs with bifid tips (Pl. VII, Fig. 16); (2) a very few small (about 0.016 mm. long) stout hairs with frayed tips on the ventral surface (Pl. VII, Figs. 13 and 14); (3) a few small (about 0.023 mm. long) slender hairs, which have the distal third serrate and often bent and are found on the prothorax and also near the posterior end (Pl. VII, Fig. 17); (4) short (0.036-0.077 mm. long) highly variable hairs, which are typically rather stout, terete or flattened, sharply angulate at the basal third and again near the distal fifth; the terminal portion is flattened and has serrate tip and margins; this type is mostly confined to the dorsal and lateral surfaces (Pl. VII, Figs. 10-12, 15, and 18-22).

Integument thin, delicate, and (except on the thorax) furnished with minute spinules arranged in short transverse rows.

Head (Pl. VII, Fig. 8) moderately large; broadly subpyriform in dorsal view, with the posterior border broadly rounded; width greatest in front of the antennæ. Hairs of head few, about 0.023 mm. long, angulate or strongly curved just distal to the middle; apical half bearing two or three fine, short branches. Antennæ rather large, with three sensillæ, each bearing a spinule.

Labrum (Pl. VII, Fig. 9) small and short, the breadth being twice the length; three-lobed, the middle lobe somewhat larger and projecting farther forward than the lateral lobes; dorsal surface with a pair of minute hairs near the center and usually a third hair near the middle of one lateral border; each lateral lobe with several sensillæ (each bearing a spinule) along the anterior border; median half of ventral surface spinulose, the spinules in transverse rows which form a subreticulate pattern; on the ventral surface of each lateral lobe a pair of sensillæ near the center and a cluster of four sensillæ near the anterior border at the junction with the median lobe. *Mandibles* (Pl. VII, Fig. 6) very small and without teeth; base subtriangular; apex slender and bent medially at an angle to the base. *Maxillæ* prominent, fused to the labium; proximal sense-organ (Pl. VII, Fig. 5) a slightly raised cluster of five sensillæ, three of which bear one spinule each; distal sense-organ (Pl. VII, Fig. 4) a short projection with two apical sensillæ, each bearing a spinule. *Labuim* prominent, a few fine ridges forming a narrow reticulate pattern posterior to the opening of the sericteries; labial sense-organ a slightly raised cluster of five sensillæ, three of which bear one spinule each. *Hypopharynx* (Pl. VII, Fig. 7) broad and furnished with longitudinal ridges.

IMMATURE SEXUAL (?) LARVA (Pl. VIII, Fig. 6): Differs from the mature worker larva of the same size in being stouter and in having the abdomen enlarged at the middle, so that the dorsal profile is more convex.

SEXUAL LARVA (Pl. VIII, Fig. 4): Voluminous and plump, much larger than the mature worker larva (Pl. VIII, Figs. 7A and B); hypocephalic; bean-shaped, somewhat curved ventrally; dorsal profile strongly convex; ventral profile concave anteriorly, slightly convex posteriorly; diameter greatest at the middle, decreasing slightly towards the ends which are rounded. Anus subterminal, with small lips. Metamerism indistinct. Spiracles, 10 pairs.

Body mostly naked, but with a few hairs of four types, each type restricted to a small area. Type I hairs: Extremely long (0.4-0.6 mm.); base stout, straight, and heavily sclerotized; attenuating rather rapidly to a fine apical portion, which is slightly curved forward; distal ⅔ serrate; restricted to the posterior ¾ of the ventral surface and arranged in 4 longitudinal rows, 5 to 8 in each outer row and 4 to 6 in each inner row (Pl. VIII, Fig. 5). Type II hairs: A few (about 10) moderately long (0.17-0.25 mm.) slender hairs, which have the apical half serrate; these are restricted to a small area at the posterior end and are strongly curved ventrally (Pl. VIII, Fig. 2). Type III hairs: A single pair of simple, slender, strongly curved hairs about 0.15 mm. long, at the anterior end, one a short distance in front of each mesothoracic spiracle (Pl. VIII, Fig. 1). Type IV hairs: A few very minute (0.009 mm. long), simple, straight, acute hairs on the prothorax around the base of the head (Pl. VIII, Fig. 3).

Head and mouth-parts like those of worker larva.

The above descriptions are based on larvæ from a single nest collected at Kartabo, British Guiana, VII-27-1920. I am indebted to Dr. W. M. Wheeler for the material.

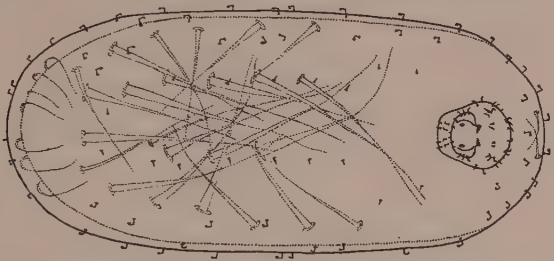
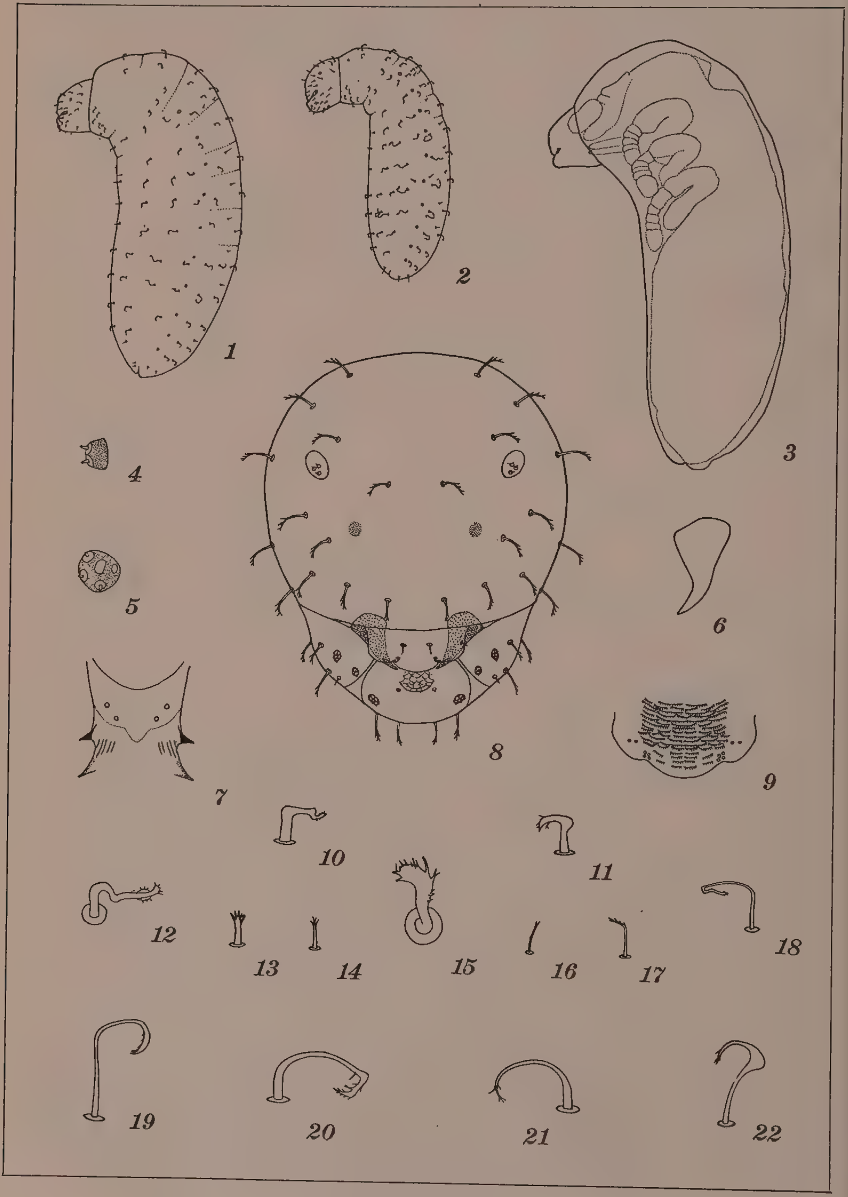


Fig. 1. *Allomerus octoarticulatus* var. *demerarae* W. M. Wheeler. Larva ready to molt to definitive sexual form; the hairs of the latter are easily seen through the transparent integument of the younger form. Ventral view. X50.

As mentioned previously the mature larvæ of worker and sexual forms are so very different that they might be regarded at first glance as belonging to different genera. That such is not the case is proved by the fact that the heads of the two types are identical and by the fact that I have found young larvæ of the sexual type still encased in an integument of the worker type (Fig. 1). Moreover, a worker semipupa enclosed in an integument of the worker type (Pl. VII, Fig. 3) shows that worker larvæ do not attain what I have designated as the definitive sexual form before pupating.

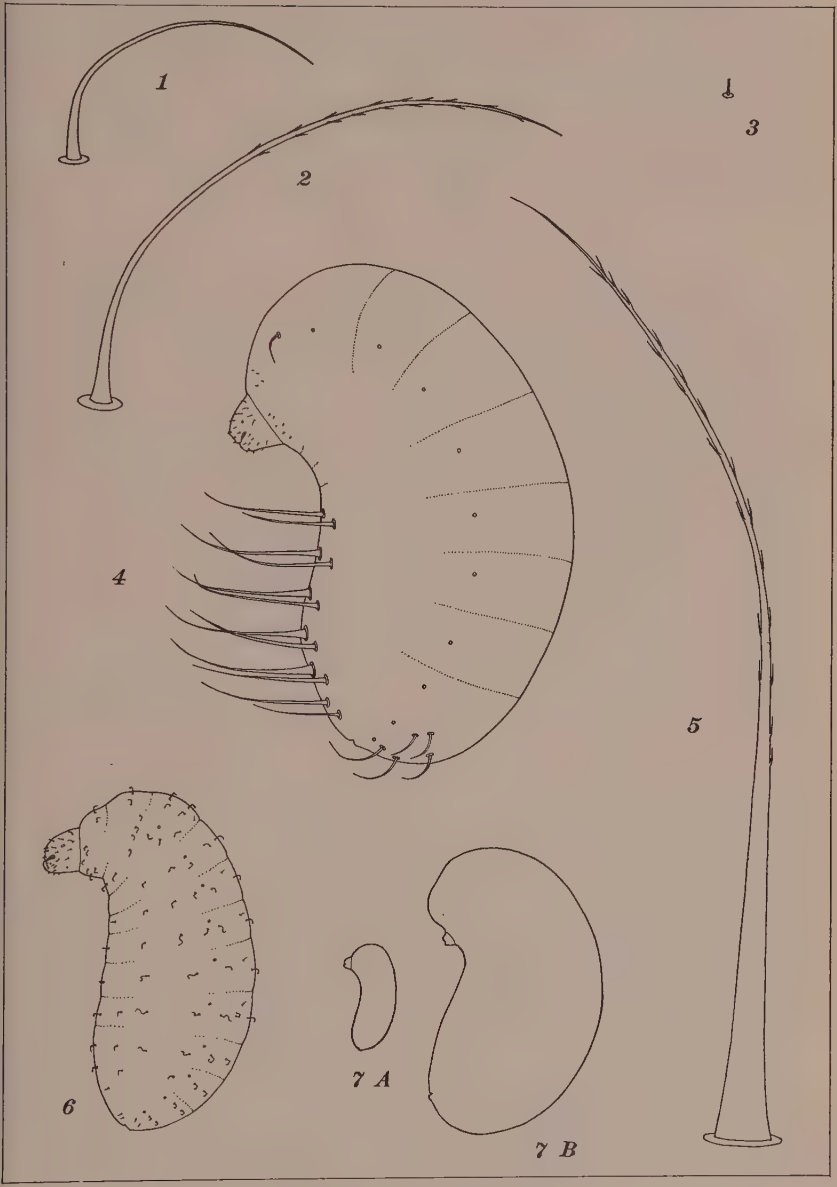
In spite of the fact that all larvæ of *Allomerus* are alike in the early instars, nevertheless, some slight differentiation occurs previous to the molt to the definitive sexual form. Such, at least, is my tentative interpretation of the material studied. The bodies of small (i. e. worker) semipupæ are

Psyche, 1935 Vol. 42, Plate VII.



Wheeler—Allomerus

Psyche, 1935 VOL. 42, PLATE VIII.



Wheeler—Allomerus

still as slender and subcylindrical as are those of most of the young larvæ. I have found, however, a few of the size of mature worker larvæ, which differ from the latter only in being stouter, and these I have described above as "immature sexual (?)" forms.

If this tentative conclusion should be substantiated in the future, *Allomerus* larvæ may prove useful in studying the problem of the differentiation of castes.

EXPLANATION OF PLATES

Plate 7.

Worker larva of *Allomerus octoarticulatus* var. *demeraræ.*

Fig. 1. Mature worker larva, in side view. X34.
Fig. 2. Young larva, side view. X34.
Fig. 3. Semipupa, side view. Hairs omitted. X34.
Fig. 4. Distal maxillary sense-organ, in profile. X550.
Fig. 5. Proximal maxillary sense-organ, surface view. X550.
Fig. 6. Mandible, dorsal view. X275.
Fig. 7. Hypopharynx, dorsal view. X275.
Fig. 8. Head, dorsal view. X190.
Fig. 9. Labrum, ventral view. X275.
Figs. 10-12 and 18-22. Type 4 body-hairs. X275.
Figs. 13 and 14. Type 2 body-hairs. X275.
Fig. 15. Type 4 body-hair, apical aspect. X550.
Fig. 16. Type 1 body-hair. X275.
Fig. 17. Type 3 body-hair. X275.

Plate 8.

Sexual larva of *Allomerus octoarticulatus* var. *demeraræ.*

Fig. 1. Type III body-hair. X275.
Fig. 2. Type II body-hair. X275.
Fig. 3. Type IV body-hair. X275.
Fig. 4. Young (half-grown?) sexual larva, side view. X34.
Fig. 5. Type I body-hair. X275.
Fig. 6. Young sexual larva before molting to definitive sexual form, side view X34.
Fig. 7. Mature sexual larva (*A*) compared in size with mature worker larva (*B*), side view. Outlines only. X10.

SOME MIMETIC FLIES, WITH THE DESCRIPTION OF TWO NEW SPECIES FROM NORTH AMERICA (SYRPHIDÆ; DIPTERA).

By F. M. Hull

University, Miss.

I have recently had occasion to mention the similarity of the lateral aspect of Cerioid flies to that of certain Hymenoptera. Since that time, I find two additional species that prove to be undescribed and are here presented. A Eumenid wasp, *Eumenes bollii* Cress., was discovered among the material from Dilley, Texas, from which *P. reinhardi* Hull was taken and is considered to be probably the "model" of that species. The resemblance, while not exact, is very striking. (Figs. e, f). In at least eight respects, the similarity between them is notable. (1) Position of abdomen; (2) simulation of folded wings; (3) pendulous antennæ; (4) apical segments of antennæ contrastingly colored; (5) pleural markings; (6) general coloration; (7) position of wings; (8) pedicellate abdomen. *C. aldrichi,* n. sp. laterally viewed, greatly resembles *Spilomyia longicornis* Loew.

Cerioides aldrichi n. sp. (Plate 9, fig. 4)

Characterized by fairly large size, yellow scutellum, posteriorly bifid, large yellow spots in anterior corners of second abdominal segment and the prominent silver-tipped style. Not closely related to any North American species. Predominating colors, yellow and black.

Length 17 mm. *Female.* Vertex yellow, the deep black of the upper section of front and of vertex encroaching upon the yellow and dividing it narrowly in the middle . The divided surfaces of the yellow spots rounded. Lower front and entire face, save for a narrow basal margin to the antennifer and a narrow median stripe, shining yellow. Cheeks very broadly, and a slender margin along the front of the epistoma, deep black. The facial stripe is dark brown and has within itself a slender stripe. Antennifer and antennæ black, the third joint a very deep brown, with a curious lighter brown pubescence. The antennifer is about one third the length of the first antennal joint, and the first joint is a little longer than the second joint. The second and third joints are about equal. The style is long, about two thirds the length of the third joint.

Thorax and pleuræ jet black; a large brilliant pale yellow spot on humeri, a smaller one just before the base of the wing, a spot on mesopleuræ, sternopleuræ, and a short, similarly colored stripe on the dorsum on either side posteriorly. Scutellum shining yellow, sharply margined with black and with a median notch posteriorly. The exceedingly short pile of the scutellum is largely black. Halteres light brown. Squamæ pale yellow.

Abdomen black, the second, third and fourth segments with wide, bright yellow posterior margins, and the last two segments with thick, prominent lunulate pollinose markings. The second segment on either side with an exceedingly large, pale yellow spot. This spot extends toward the middle in its own anterior corner, but is rounded off and does not meet, and the spot is elongated posteriorly in a medial oblique direction almost to the yellow posterior margin of the segment. Thus, the lateral margin of the second segment is black from the posterior corner almost to the anterior corner. Venter black, with prominent yellow cross bands. Legs largely light brownish-yellow, the tibiæ distally and the hind femora on the outer half with a darker brownish area. Coxæ black. Trochanters dark brown. Wings infuscated along the anterior edge, more yellowish on the basal two-thirds of the margin.

One female, Susanville, California (July). W. J. Chamberlin collector. Type in the collection of the author.

A fairly large species not related to any North American form with which I am acquainted. In fact, with the broad abdomen basally, the very short antennifer and large conspicuous yellow spots on the base of the abdomen the species must approach the somewhat generalized hypothetical type described by Shannon (Insecutor Inscitiæ Menstruus, xiii, p. 49). Its short antennifer precludes placing the species in

Tenthredomyia. I do not believe that a subgeneric assignment should be made upon it, lacking a male specimen, and also in view of the fact that there is a slight antennifer, it seems best to consider it as a highly aberrant *Cerioides.*

Tenthredomyia ancoralis Coq.

One male. Las Cruces, New Mexico. July (F. M. Hull) on flowers of privet.

Tenthredomyia abbreviata Loew.

Several specimens, males and females, near Ames, Ia., July 19 (F. M. Hull).

Tenthredomyia tridens Loew.

A large series collected by A. Spuler at Toppenish, Wash., July 22 to August 1.

Tenthredomyia mime n. sp. (Plate 9, fig. 1)

An odd species, of bluish black coloration with ivory white markings. The color, together with the entirely dark wings, with their blue and purple irridescence, makes it a very unique member of the North American *Cerioidini.* It bears a striking resemblance to a bluish-black species of wasp.

Length 15 mm. including antennæ. *Female.* Vertex ivory white, the upper occiput on either side and the front and region about occelli black, the latter with a V-shaped intrusion posteriorly into the white of the vertex. Antennifer, its base, and a short space below broadly extending to the eyes and continued medially as a narrow facial stripe, black. The face with a large, white triangle on either side and a small, white spot on the margin of the eyes just opposite the antennifer together with a pair of similar smaller spots just above the base of the antennifer. The median black stripe of the face is connected with the black oral margin and the cheeks are broadly and entirely black. Antennæ entirely black. The antennifer equal in length to the first and second joints and these latter segments of equal length. The third segment slightly longer than the second. The style quite short.

The thorax entirely black save for a white spot on the humeri, and mesopleuræ, and a smaller one before the base of the wing and again on the sternopleuræ. The scutellum broadly whitish with a narrow brownish rim posteriorly and anteriorly. Halteres and squamæ light brown.

Abdomen black, with a large, oblong white spot in the anterior corners of the second segment, a white posterior margin on the second and third segments, the former noticeably thinned in the middle and wider in the posterior corners. On the posterior margin of the fourth segment there is only a minute median white spot.

Legs black, with the narrow apices of the femora, the basal third of the tibiæ and the hind femora basally, narrowly light-brownish to yellow. Wings entirely dark, with bluish and purplish reflections, the infuscation slightly diluted on the extreme posterior edge.

Type, a female, Tallulah, Louisiana. This remarkable species mimics certain of the bluish wasps. Type in the collection of the author.

EXPLANATION OF PLATE 9.

Fig. 1. *Tenthredomyia mime* n. sp.

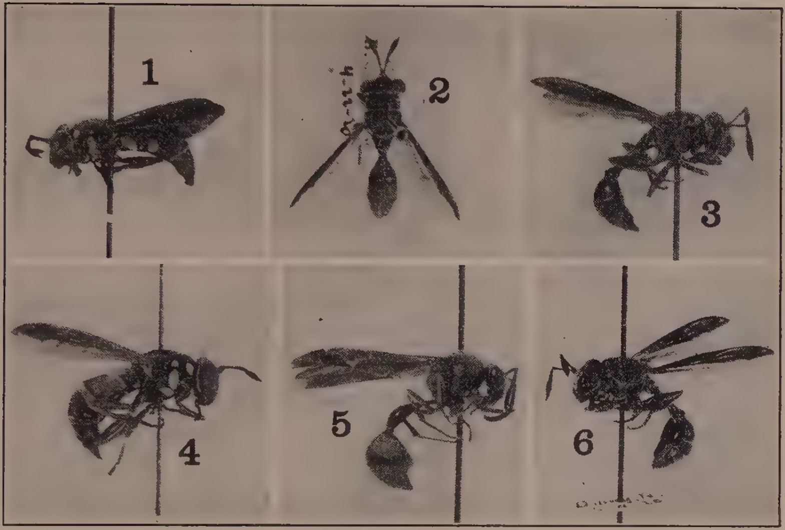
Fig. 2. *Polybiomyia festiva* Hull.

Fig. 3. *Polybiomyia reinhardi* Hull, showing ventral abdominal concavity.

Fig. 4. *Cerioides aldrichi* n. sp.

Fig. 5. A species of wasp, *Eumenes bollii* Cress., which P. *reinhardi* greatly resembles.

Fig. 6. *Polybiomyia reinhardi* Hull, showing pollinose lunulæ of abdomen.



Hull—Mimetic Flies

NEW NEARCTIC MECOPTERA, WITH NOTES ON OTHER SPECIES

By F. M. Carpenter

Museum of Comparative Zoölogy, Harvard University

During the three years subsequent to the publication of my revision of the Nearctic Mecoptera[1], a number of new and interesting species have come to my attention. Some of these were taken by me in the central and western states, but by far the majority were received from other entomologists, as follows: Mr. E. S. Thomas, Ohio State Museum; Mr. C. A. Frost, Framingham, Mass.; Dr. C. B. Philip, Hamilton, Montana; Dr. H. B. Mills, Yellowstone National Park, Wyoming; Mr. E. P. Van Duzee, California Academy of Sciences; Mr. L. C. Lloyd, Seattle, Washington; Dr. H. H. Ross, Illinois State Museum, Urbana, Illinois; Dr. Hugo Kahl, Carnegie Museum, Pittsburg; and Dr. C. E. Mickel, University of Minnesota. To all these I am grateful for their coöperation.

In the present paper I have included the most interesting of the new locality records and descriptions of eight new species. Including the latter, the total number of Nearctic species is sixty-four.

Family Panorpidæ

Brachypanorpa montana Carp.

Bull. Mus. Comp. Zoöl., 72 (6) : 212; 1931.

Four males were taken among pines at Crater Lake, Oregon, July 16, 1932, at an altitude of about 8,000 feet (F. M. Carpenter). As far as I am aware, these are the only specimens in addition to the types which have been collected. No females were found in spite of careful searching.

Panorpa lugubris Swederus

Kgl. Svenska Vetensk.-Akad. Nya Handl., 8:279, 1787.

In the collection of the Illinois State Museum there is a specimen of this species labeled "N. Mex.". Since *lugubris* has previously been reported only from the Carolinas, Georgia, Florida and Alabama, a New Mexico record is most surprising. Dr. Ross, of the Illinois Museum, assures me, however, that the locality datum is almost certainly correct. If so, this specimen extends by some three hundred miles (to about longitude 103°) the westward range of Panorpa in the Nearctic region, for I have seen no previous records of the genus beyond Austin, Texas (longitude 98°).

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[1] Bull. Mus. Comp. Zool., 72 (6): 205-277, pls. 1-8, 1931. See also Bull. Brooklyn Ent. Soc. 27: 149-151. 1932.

Panorpa insolens, n. sp. (Figure 5.)

Body: light reddish-brown. Fore wing: length 12 mm.; width 3 mm., membrane faintly yellow, markings grayish-brown; apical and pterostigmal bands entire; basal band broken at the middle, but very broad, both upper and lower portions fusing with the first basal spot; second basal spot very small; both marginal spots absent; cross veins not margined. ♀ genitalia: internal skeleton small, the axis entirely confined to the plate, not projecting anteriorly as in most species of the genus. Male unknown.

Holotype: Cincinnati, Ohio; May 30, 1908; in Museum of Comparative Zoölogy.

Although in describing this species from the female alone, I have departed from my usual policy of not establishing a new species of Panorpa unless the male is known, I consider the wing markings of this particular insect so unusual that the male when found will at once be recognized. In none of the other Nearctic Mecoptera has the basal band been modified to anything like the form in *insolens*. The internal skeleton is close to that of *P. carolinensis* Banks, and I suspect that the male when found will have a genital structure also close to that of *carolinensis*. In my key to the females of Panorpa (1931, p. 224) insolens runs to section 9, including *signifer, carolinensis* and *longicornis*, from all of which it can be readily separated by the form of the basal band of the fore wing.

Panorpa virginica Banks

Psyche, 13 : 99; 1906.

Two males in the Illinois State Museum are labeled "Wisconsin," the first record of the species in that state.

Panorpa isolata Carp.

Bull. Mus. Comp Zoöl., 72 : 241; 1931.

One male from Waukegan, Illinois, July 7, 1932 (T. H. Frison) is in the Illinois State Museum. Since this species has not previously been found outside of Georgia, the Carolinas and Tennessee, the Illinois record is most interesting and unexpected; it probably signifies that the species occurs in Kentucky and Ohio.

Panorpa speciosa Carp. (Figure 4.).

Bull. Mus. Comp. Zoöl., 72 : 243, 1931.

During the summer of 1934 I was fortunate enough to secure two males and a female of this rare species, which has previously been known only from four males. Both were taken at Vandalia, Illinois, June 28, 1934. The female is similar to the male in coloration and wing markings. The internal skeleton (figure 4) is small but has a very deep "U"-shaped cleft; the axis is small, projecting only a short distance beyond the plate itself; there is a small chitinous envelope covering a part of the axis and surrounding part of the plate. This female, now in the Museum of Comparative Zoölogy, is designated as the allotype.

Panorpa bifida, n. sp. (Figures 1, 3.)

Body brown to yellow; anal horn present. Fore wing: length 11-13 mm.; width, 3-4 mm.; membrane faintly yellow, markings dark-brown or black; apical band entire; pterostigmal band broken at middle; basal band interrupted; first basal and first and second marginal spots present; second basal spot absent; cross veins margined. ♂ genitalia: genital bulb rounded; forceps of moderate size, the distal half quite slender; hypovalves long, extending very nearly to the base of the forceps; ventral valves elaborate, each consisting of a single semi-circular basal piece which forks distally into two long branches; the outer one of these is the longer, is slightly curved, and bears a number of barbs; the inner branch is nearly straight and is also barbed. ♀ genitalia: internal skeleton small; the posterior part of plate in the form of a half-moon; the anterior part with a deep, broad "U"-shaped incision.

Holotype (♂): Rector, Penna., July 18, 1921; in the Carnegie Museum, Pittsburg, Pennsylvania.

Allotype: same locality and date as holotype; in the Carnegie Museum, Pittsburg, Pennsylvania.

Paratypes: 1 ♂, Rector, Pennsylvania, July 31, 1921; 1 ♀, Allegheny Co., Pennsylvania, July; in the Museum of Comparative Zoölogy.

This unusual Panorpa is closest to *anomala* Carp. in both wing markings and genitalia. The male genital bulb of *bifida*, however, has longer forceps and hypovalvæ, and the shape and lengths of the ventral valves are very different. The internal skeleton of the female genitalia has a much broader incision posteriorly than that of *anomala*. In my key to the males of Nearctic Mecoptera (Bull. Mus. Comp. Zoöl., 72 (6), 1931) *bifida* runs to the couplet containing *dissimilis* and *decorata* (28), from both of which it can readily be separated by the forked ventral valves. The female runs to the last group of species under number 22 and can be distinguished from the species included there only by the structure of the internal skeleton.

Panorpa flexa, n. sp. (Figure 2.)

Head, thorax and first 6 segments of abdomen dark-brown, nearly black; abdominal segments 7-9 yellowish-brown; anal horn absent. Fore wing: length, 11 mm. width, 3 mm.; membrane colorless, markings light brown, all bands interrupted; both marginal and both basal spots absent, cross veins margined. ♂ genitalia: genital bulb rather slender, forceps of moderate size, without lobes; a cluster of heavy, black hairs at base of forceps; hypovalves long, almost reaching to the base of the forceps; ventral valves consisting of a long, cylindrical, glaborous shaft, smoothly curved; at the base of this shaft is a cluster of 5 radiating barbs; an abruptly tapered point terminates the shaft itself. Female unknown.

Holotype (♂): Indian Pass, Smoky Mts., N. Carolina; September 4, 1933 (C. F. Walker); in the Museum of Comparative Zoölogy.

This locality is almost identical with that at which the types of *P. longicornis* and many other Panorpas were collected by the writer at the same season three years previous. Although no specimens of *flexa* were among the several hundred Panorpas which were secured at that time, the specimen described was the only Panorpa which Mr. Walker collected in the vicinity.

Since *flexa* does not possess the anal horn, it falls into the *nebulosa* group of Panorpa, and in my key (1931, p. 222) runs to couplet 7. As this couplet reads, *flexa* will not be covered by either choice; but if the first line of the couplet be changed to "ventral valves curved," both *flexa* and *sigmoides* will be included. From *sigmoides* the new species can be distinguished by the shape of the ventral valves, which are sigmoidally curved in *sigmoides* but nearly semicircular in *flexa*.

Panorpa latipennis Hine

Bull. Sci. Lab., Den. Univ., **11** : 248, 1901.

Two females received from E. S. Thomas, of the Ohio State Museum, were collected in Ohio: Fallsburg, June 18, 1932 (C. F. Walker), and Bay Point, Ottawa County, July 18, 1931. These are the first records in the state and bear out my previous suggestion (1932) that *latipennis* probably occurred in Ohio and Pennsylvania.

Panorpa submaculosa Carp.

Bull. Mus. Comp. Zoöl., **72** (6) : 255; 1931.

One female was taken by C. E. Mickel in Prince George Co., Maryland, July 27, 1929; this constitutes the first record for the state.

Family Bittacidæ

Bittacus punctiger Westwood

Trans. Ent. Soc. Lon., 4:195; 1841.

One male, now in the Museum of Comparative Zoölogy, was collected at Dunedin, Florida, during March (Blatchley); this constitutes the first record in that state, although the species has previously turned up in neighboring states.

Family Boreidæ

During the past two years several extensive collections of Boreus, mostly from western states, have been received for determination. One very unusual species (*reductus*) from this lot has already been described[2]. Quite recently, also, Mr. L. C. Lloyd has described[3] another species (*intermedius*) from Alaska, and recorded the occurrence of *B. unicolor* at the same locality. Through the courtesy of Mr. Lloyd and the authorities of the Washington State Museum, these specimens were sent to me for examination. Much to my surprise, a study of all the Boreus material now at hand reveals that among the recently collected Western material there are no less than five undescribed species, making a total of twelve species of the genus now known from the Nearctic region.

These additional species have brought to light several new characteristics which are most useful in the taxonomy of at least the Nearctic members of Boreus. The most important of these is the form of the hypandrium (tenth sternite), which may be either narrowly or broadly triangular, and may be either emarginate (notched) or entire (straight). Since the shape of the hypandrium is very helpful in the identification of the new species described below, I have also included here figures or descriptions of other Nearctic species of the genus. Some of the new species are also characterized by the color and length of the pubescence, features which show very little difference among the previously described ones. The lengths of the rostrum and ovipositor are likewise convenient diagnostic characteristics, but I have found it advisable to measure these at somewhat different positions from formerly. In the present descriptions the rostrum is measured from the ventral edge of the eye, and the ovipositor from the posterior margin of the ninth tergite[4]. This gives a slightly smaller dimension for the length of the ovipositor than when it is measured from the corresponding sternite, but the measurement is more easily obtained since the specimens are usually glued to points and the ventral surface of the head thus concealed. The detailed coloring of the various parts of the body, as I have already pointed out, is of little taxonomic value, because it is subject to much individual variation.

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[2] Can. Ent., 65: 94-95. 1932.

[3] Pan. Pacific Ent., 10: 119-120. 1934.

[4] the *ninth* tergite because the tenth is modified to form a long sheath covering the ovipositor proper.

Since there are now more than twice as many species of Boreus as were known when my key was published (1931), new keys to both sexes are included here.

Key to Males of Boreus

1. Hypandrium entire .... 2.
   Hypandrium emarginate .... 8.
2. Wings and all of body black .... 3.
   Wings brown or yellow .... 4.
3. Body covered with long, white pilosity; hypandrium slenderly triangular .... *reductus* Carp.
   Body covered with very fine, white pubescence, hypandrium broadly triangular .... *unicolor* Hine.
4. Fore wings *gradually* tapering throughout their entire lengths .... 5.
   Fore wings strongly narrowed in proximal half .... 6.
5. Fore wings very broad and long, two and one-half times the length of the rostrum (British Columbia) .... *elegans* n. sp.
   Fore wings not so broad and of moderate length, only one and one-half times the length of the beak (eastern United States) .... *nivoriundus* Fitch.
6. Distal half of wings very slender; rostrum twice the length of the eye .... *intermedius* Lloyd.
   Distal half of wing normally slender; rostrum only one and one-half times the length of the eye .... 7.
7. Body except wings black or nearly so .... 8.
   Body brown or reddish brown .... *californicus* var. *californicus* Packard.
8. Wings yellow-brown .... *borealis* Banks.
   Wings dark brown .... *californicus* var. *fuscus* n. var.
9. Body covered with long white or yellowish pilosity .... 10.
   Body covered with very fine white pilosity .... 11.
10. Wings and body deep black .... *nix* n. sp.
    Wings yellow or light brown, body dark brown .... *pilosus* n. sp.
11. Wings yellowish-brown, much lighter than the dark brown body .... *isolatus* n. sp.

Wings either black or brown, always the same color as the body .... *brumalis* Fitch.

Key to Females of Boreus

1. Fore wing reduced to a minute scar, similar to that of the hind wing .... *reductus* Carp.
   Fore wing in the form of a small oval pad .... 2.
2. Wings and body the same color (brown or black) ...... 3.
   Wings much lighter (yellow or yellow-brown) than body (dark brown or black) .... 7.
3. Ovipositor short, only as long as rostrum .... 4.
   Ovipositor distinctly longer than rostrum .... 5.
4. Body either black or very dark brown.... *brumalis* Fitch.
   Body light brown or medium brown.... *nivoriundus* Fitch.
5. Body covered with long, white or yellowish hairs .... *nix* n. sp.
   Body covered with fine, white pubescence .... 6.
6. Ovipositer twice as long as rostrum........ *unicolor* Hine.
   Ovipositer only one and one-half times as long as rostrum .... *gracilis* n. sp.
7. Ovipositer twice the length of the rostrum .... *intermedius* Lloyd.
   Ovipositer at most one and one-half times as long as the rostrum .... 8.
8. Body light brown or reddish brown .... *californicus* var. *californicus* Packard.
   Body black or nearly so .... 9.
9. Body black, with a pronounced bronze hue; abdomen above exceedingly shiny .... *borealis* Banks.
   Body jet black; abdomen above with only a slight shine.. *californicus fuscus*, n. var.

Boreus brumalis Fitch

Amer. Journ. Agric., 5 : 278; 1847.

Although this species has previously been known to occur only in Massachusetts, New York, District of Columbia and Michigan (Detroit), a great many specimens have been taken in Hocking and Fairfield Counties, Ohio, December 5-25, 1933 (E. S. Thomas, J. S. Thomas, W. Goslin, R. Goslin). These Ohio specimens, although somewhat smaller and more uniformly black than the New England specimens, show no structural differences whatever. The posterior margin of the hypandrium is emarginate, the hypandium as a whole being shaped much like that of *isolatus*, n. sp. (figure 11). The body of *brumalis* is covered with a prominent yellow pubescence, which is more striking in the black specimens than in the brown ones.

Boreus nivoriundus Fitch

Amer. Journ. Agric., 5 : 277; 1847.

This is another species which, previously known only from New England and northern New York, has been found in Hocking and Fairfield Counties by the above-named collectors (December 5-25, 1934). The Ohio specimens, like those of *brumalis*, are very much smaller than the more eastern ones, being about one-half the length of the latter. In all other respects, however, the Ohio specimens and the New England ones are identical. The fact that the more southern specimens of both *brumalis* and *nivoriundus* are decidedly smaller than the northern ones suggests that the more moderate climatic conditions tend to cause smaller specimens in this particular genus of insects, which are of course only active in the adult stages from November to February.

The hypandrium of *nivoriundus* is entire and shaped very much like that of *unicolor* (figure 15). The color of the body is subject to some variation, the New England specimens being light brown and the Ohio ones somewhat darker, but the color never reaches the blackish brown of *brumalis*.

Boreus unicolor Hine (Figure 15.)

Bull. Sci. Lab. Den. Univ., 11:250; 1901.

This insect has previously been recorded only from Bozeman, Montana, and Reno, Nevada (6,600 ft.). In the collections sent by Dr. Philip and Dr. H. B. Mills there are 15 specimens of both sexes from Blacktail Flat and Specimen Ridge, Yellowstone National Park, Wyoming, March 17, 1934 and Feb. 5, 1935; and several specimens from Gird's Creek, Ravalli County, Montana, November 2 and December 30, 1934 (N. L. Jellison). Mr. Lloyd (1934) recorded this species from Alaska also, but his specimens really belong to a new species (*gracilis*) described below.

The hypandrium is entire and broadly triangular in outline (figure 15). The body is covered with a very short pubescence; the beak is short, about one and one-half times as long as the eye, and only half as long as the ovipositor.

Boreus nix n. sp. (Figure 7.)

Male: length of body, 3 mm.; uniformly black except the eyes, which are either black or dark brown or both; entire body including wings covered with long, white pilosity, except pronotum, which bears two rows of very long heavy black hairs, one row along the anterior margin, the other along the posterior margin; wings with the outer margin smoothly curved, as in *unicolor* (see Carpenter, 1931, fig. 6d); hypandrium broadly triangular, deeply emarginate (figure 7); rostrum short, less than one and one-half times the length of the eye.

Female: length, 4 mm.; entire body, including wings, black and covered with long white pilosity; ovipositor one and one-half times the length of the rostrum; fore wing covering entire hind wing scar.

Holotype (♂) and allotype: Gird's Creek, Ravalli County, Montana, November 2, 1934, on snow (W. L. Jellison); both in Museum of Comparative Zoölogy.

Paratypes: 1 ♂ with same collecting data as holotype; 2 ♂, 2 ♀, Hamilton Heights, Ravalli County, Montana, November 15, 1931, on snow (C. B. Philip); all in writer's collection; 1 ♀ Hamilton Heights, Ravalli County, Montana, November 15, 1931, in collection of the California Academy of Sciences.

This interesting species is easily recognized by the combination of the black wings, emarginate hypandrium, and long, white pilosity. The latter is visible without magnification and gives the insect a fuzzy appearance.

Boreus pilosus n. sp. (Figure 10.)

Male: length, 3 mm.; wings light brown, genital claws and hypandrium brown, legs light brown or dark brown; eyes dark brown or black; rest of body black; entire body covered with long, yellowish-white pilosity, especially well developed on the abdominal terga; pronotum with two rows of very long, heavy, yellow-brown hairs; hypandrium emarginate, the notch broadly "V"-shaped; rostrum long, more than twice as long as the eye.

Female: length, 4.5-5 mm.; wings, ovipositor and legs light brown or yellow-brown; eyes dark brown or black, pronotum reddish brown; rest of body black; entire body covered with prominent yellow pilosity, which is especially long and deeply colored on abdominal terga; pronotum with the two rows of long yellow-brown hairs as in male; ovipositor short, only a little longer than the rostrum; fore wing covering hind wing scar.

Holotype (♂) and allotype: Kaslo, British Columbia, December, 1932; both in Museum of Comparative Zoölogy.

Paratypes: 2 males, 8 females, all with same collecting data as holotype in Museum of Comparative Zoölogy; and 1 female from the same lot in the California Academy of Sciences.

Boreus isolatus n. sp. (Figure 11.)

Male: length, 3.2 mm.; wings light brown, eyes brown, legs dark brown with the joints black; rest of body black; most of body covered with very fine, short, white pilosity, uniform over most of body, absent only on the anterior half of each abdominal tergum; hypandrium rather narrow, and emarginate, the notch being in the form of a "V"; rostrum short, scarcely longer than the eye. Female unknown.

Holotype (♂): Como Lake, Ravalli County, Montana, January 6, 1935 (W. L. Jellison); in Museum of Comparative Zoölogy.

Although somewhat hesitant to describe this species from the single male at hand, I believe that the characteristics of the male are so distinctive that it unquestionably represents an easily recognized species. It is the only one of the western species of Boreus which has the combination of the emarginate hypandrium and short pilosity, the other species with the emarginate hypandrium (*pilosus* and *nix*) having long pilosity over the entire body, and especially on the abdominal terga.

Boreus intermedius Lloyd

Pan. Pacific Ent., **10**:119-120; 1934.

Male: length, 3.5 mm.; wings and legs yellow or yellow-brown, hypandrium and genitalia yellow and brown, eyes grayish brown, mottled with black, rest of body dark bronze, almost black; entire body covered with fine, short pubescence, nearly absent on abdominal terga; wings abruptly narrowed near the middle, as in *californicus*, but with the distal half much more slender than in that species; hypandrium entire, narrowly triangular; rostrum twice as long as the eye.

Female: wings yellow, legs yellow-brown, ovipositor brown and dark brown, eyes grayish brown; rest of body dark bronze; entire body covered with fine, short, white pilosity nearly absent on abdominal terga; fore wing completely covering hind wing scar; oviposíter scarcely (if at all) longer than the rostrum.

Holotype (♂) and allotype: collected between Kennecott and McCarthy, Alaska, April 15, 1934; on snow; both in Washington State Museum[5].

The male of this species resembles closely that of *californicus*, but differs in having the distal half of the wings much more slender than in that species. The female, also, approaches that of *californicus* but can be distinguished by the much shorter ovipositer.

Boreus borealis Banks. (Figure 14.)

N. Amer. Fauna, Bur. Biol. Surv., U.S.D.A., **46**:158; 1923.

Male: length 4 mm.; wings yellow-brown; hypandrium and legs light brown and brown; eyes brown; rest of body black; with a pronounced bronze hue; abdomen above extremely shiny; short, white pilosity sparsely distributed over body, reduced on terga; pronotum without long spines; wings strongly narrowed in the proximal half; hypandrium entire; rostrum one and one-half times the length of the eye.

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[5] After this paper had been sent to the press a pair of *intermedius* were forwarded to me by Mr. Lloyd; both were collected at the type locality (April 29, 1935) and have been deposited in the Museum of Comparative Zoölogy.

Female: length, 5 mm.; color as in male; pilosity sparse, especially on abdomen; wing pads yellow, covering hind wing scars; ovipositer one and one-half times the length of the beak.

This rare species, of which only four specimens are known, has not been collected outside of the type locality, St. Paul Island, Bering Straits, Alaska. It closely resembles the *fuscus* var. of *californicus*, but differs in the bronze coloration and the brilliant shine of the abdomen.

Boreus californicus Packard. (Figure 13.)

Proc. Bost. Soc. Nat. Hist., 8:408; 1871.

Male: length 3.5-4 mm.; wings light yellow to light brown; eyes gray, rest of body brown, usually more or less bronze in color; body covered with fine, short, white pubescence, nearly absent from abdominal terga; fore wings abruptly narrowed at about the middle; hypandrium entire, broadly triangular; rostrum one and one-half times as long as the eye.

Female: length 5 mm.; color similar to that of the male, wing pads yellow to light brown; fine, short, white pilosity covering body, but much reduced on abdominal terga; ovipositor one and one-half times as long as the rostrum; fore wing pads covering hind scar.

A study of the specimens of *californicus* now at hand shows that there is much variation in the coloration of these insects, some having the body definitely brown and the wings yellow; others, the body black and the wings brown. The type specimens, all from Ft. Bidwell, Siskiyou County, California, are of the former class, with brown bodies and yellow wings in both sexes. A series of 7 specimens from Goose Lake, Siskiyou County, are somewhat similar, though the bodies are a dark brown and the wings a light brown. These seem to me to represent the typical *californicus*. The darker specimens have been found only in more northern regions (British Columbia, Alberta and Montana) and appear to me to deserve a varietal rank, designated here as *fuscus*.

Boreus californicus var. **fuscus** n. var.

Male: length, 3 mm.; wings and legs brown or even dark brown; eyes gray-brown; rest of body black; body covered with a fine, short, white pilosity, much reduced on abdominal terga; wings and hypandrium shaped as in typical *californicus;* rostrum one and one-half times as long as the eye.

Female: length, 4 mm.; wings and legs light brown, eyes gray-brown; rest of body black; fine, white pilosity over body as in male; ovipositer one and one-half times as long as rostrum; fore wing pad covering hind wing scar.

Holotype (♂) and allotype of var. *fuscus*: Kaslo, British Columbia, January 3, 1908; in the Museum of Comparative Zoölogy.

Paratypes: 1♂, Gird's Creek, Ravalli County, Montana, November 4, 1934 (W. L. Jellison); 3 ♂, 7 ♀, same data, November 2, 1934 (W. L. Jellison); 2 ♀, 2 ♂, Kaslo, B. C., January 3, 1908; 4 ♀, 1 ♂, Terrace, B. C.; 1 ♂, Sulphur Mt., Alberta, February 10; all in writer's collection.

Boreus gracilis n. sp.

Female: length, 5 mm.; wings, legs, ovipositor very dark brown, almost black; eyes and rest of body black; white pilosity on body somewhat longer than that of *californicus*, but nearly absent on abdominal terga; pronotum with two rows of long, heavy, black spines; rostrum twice the length of the eye; ovipositor one and one-half times the length of the rostrum; fore wing pads small, not entirely covering the hind wing scar, the posterior half of which is visible from above. Male unknown.

Holotype (♀): collected between Kennecott and McCarthy, Alaska, April 15, 1934 (W. L. Lloyd); in Washington State Museum.

Paratype: 1 ♀, with same locality data as holotype; in Museum of Comparative Zoölogy.

The specimens on which this species is based were determined by Lloyd (1934) as *unicolor* Hine. They are excluded from this species, however, by the difference in the lengths of the rostrum and the ovipositor, as well as by the partially reduced fore wing pads, a characteristic which is not shared by any other of our Boreus.

Boreus reductus Carp. (Figure 9.)

Can. Ent., 65:94-95; fig. 1; 1932.

This species has previously been known only from the five types, collected at Kaslo and Lillooet, B. C. Five additional specimens, three males and two females, are present in the material sent to me by Dr. Philip. All were taken in Ravalli County, Montana, two at Gird's Creek (Nov. 2, 1934) and the others at Como Lake (Jan. 6, 1935) by W. L. Jellison. Since the Montana locality is almost two hundred and fifty miles south of Kaslo, the range of the species is extended considerably by the new material. These specimens have also enabled us to make a better diagnosis of the species than was possible with the type material alone. The females, of course, are readily distinguished by the complete loss of the fore wing pads. Both males and females are covered with a long, white pilosity, longer than that of any of the other species of Boreus except two of the species described above (*nix* and *pilosus*). The hypandrium of the male (figure 9) is long and slender, the sides in the distal half being nearly parallel.

Boreus elegans n. sp. (Figures 8, 12.)

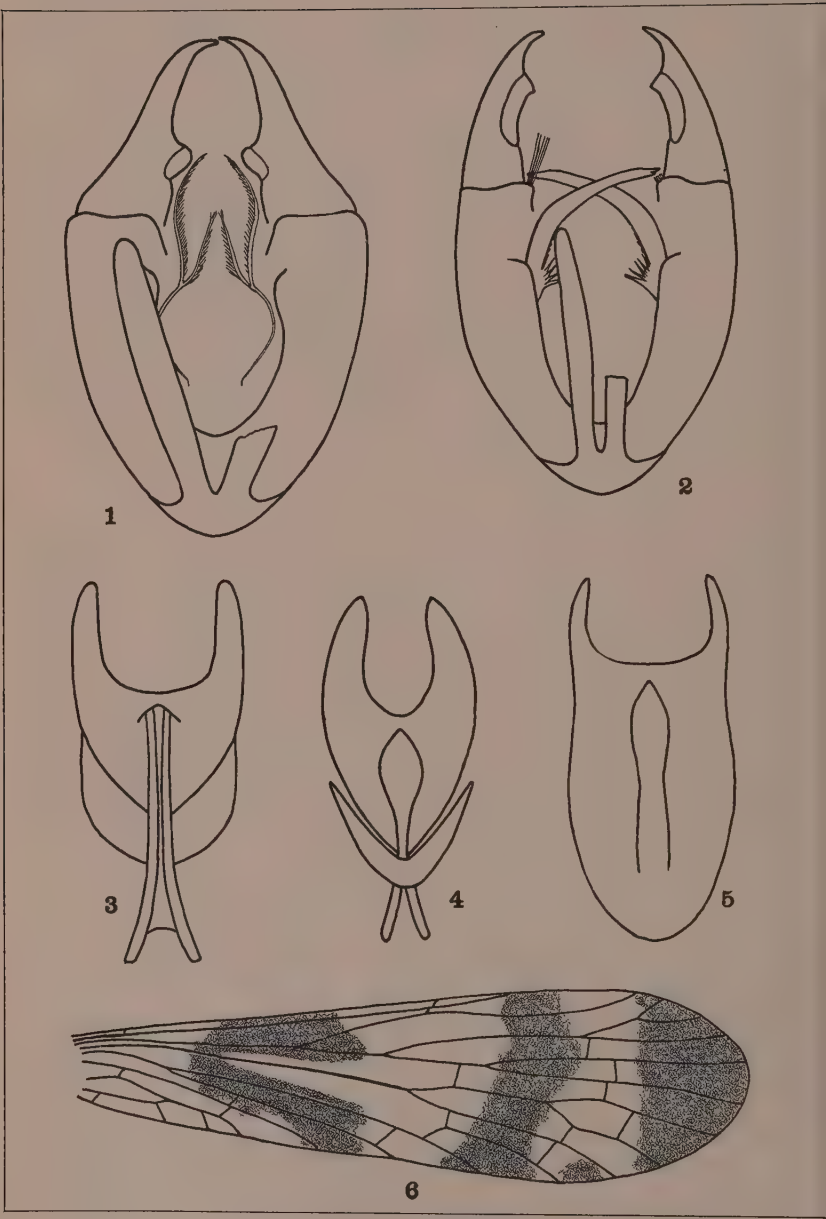
Male: length, 3.5-3.8 mm.; wings and legs light brown, almost yellow; hypandrium, rostrum and pronotum reddish brown; eyes dark red; head and abdomen dark reddish brown; fine, white pilosity over body, well developed on the abdominal terga; pronotum with two rows of long, black spines; fore wings long and very broad, two and one-half times as long as the rostrum and broader than in any other species of the genus, the outer margins almost straight; hypandrium entire, narrowly triangular; rostrum not quite one and one-half times the length of the eyes. Female unknown.

Holotype (♂): Vancouver, B. C., Dec. 1930 (H. E. Hinton); in California Academy of Sciences.

Paratype: 1 ♂ with same locality data as the holotype; in Museum of Comparative Zoölogy.

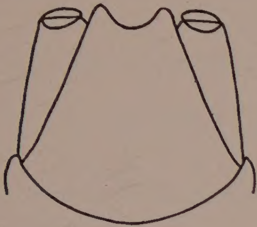
This is the most striking of the Nearctic species of Boreus; it is the only one of our species with a dominant reddish coloration. The wings are much like those of the eastern *nivoriundus*, the outer margins being quite straight, but they are much longer, being two and one-half times the

Psyche, 1935 Vol. 42, Plate X.



Carpenter—Mecoptera

Psyche, 1935 Vol. 42, Plate XI.



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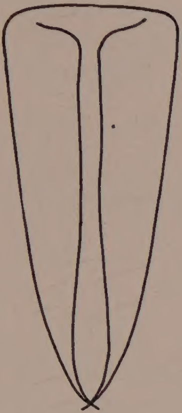

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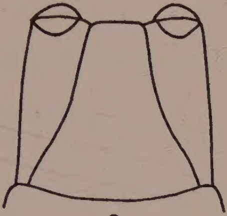

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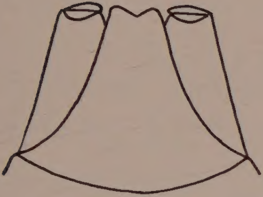

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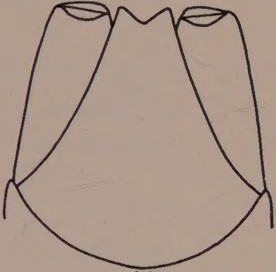

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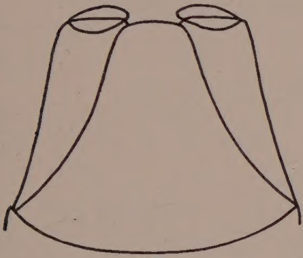

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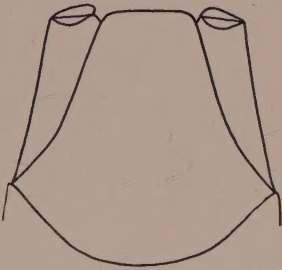

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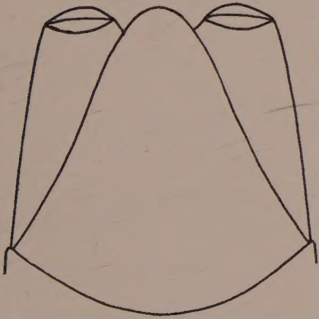

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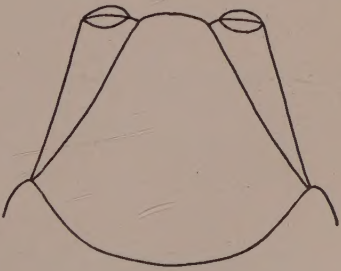

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Carpenter—Mecoptera

length of the rostrum as compared with one and one-half times in *nivoriundus*.

EXPLANATION OF PLATES.

Plate 10.

Fig. 1. *Panorpa bifida*, n. sp., ♂ genital bulb of holotype.
Fig. 2. *Panorpa flexa*, n. sp., ♂ genital bulb of holotype.
Fig. 3. *Panorpa bifida*, n. sp., internal skeleton of ♀ allotype.
Fig. 4. *Panorpa speciosa* Carp., internal skeleton of ♀ allotype.
Fig. 5. *Panorpa insolens*, n. sp., internal skeleton of ♀ holotype.
Fig. 6. *Panorpa insolens*, n. sp., fore wing of holotype.

Plate 11.

Fig. 7. *Boreus nix*, n. sp., hypandrium of ♂ holotype.
Fig. 8. *Boreus elegans*, n. sp., wings of ♂ holotype.
Fig. 9. *Boreus reductus* Carp., hypandrium of ♂.
Fig. 10. *Boreus pilosus*, n. sp., hypandrium of ♂ holotype.
Fig. 11. *Boreus isolatus*, n. sp., hypandrium of ♂ holotype.
Fig. 12. *Boreus elegans*, n. sp., hypandrium of ♂ holotype.
Fig. 13. *Boreus californicus* Packard, hypandrium of ♂.
Fig. 14. *Boreue borealis* Banks, hypandrium of ♂ cotype.
Fig. 15. *Boreus unicolor* Hine, hypandrium of ♂.

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